

Example #14: A transformer has 50 primary turns and 2000 secondary turns. If the primary is connected to a 240 V source, and the secondary current is 2.5 mA, what is the:

- a) secondary voltage?
- b) primary current?
- c) power output of the secondary coil?
- d) power output of the primary coil?

$$\frac{N_p}{N_s} = \frac{V_p}{V_s} = \frac{I_s}{I_p}$$

$$N_p = 50$$

$$N_s = 2000$$

$$V_p = 240$$

$$I_s = .0025$$

$$a) \frac{50}{2000} = \frac{240}{V_s}$$

$$\boxed{V_s = 9.6 \times 10^3 \text{ V}}$$

$$b) \frac{50}{2000} = \frac{.0025}{I_p}$$

$$\boxed{I_p = 0.100 \text{ A}}$$

$$c) P_p = I_p V_p = .100(240)$$

$$\boxed{P_p = 24 \text{ W}}$$

d) 100% efficient transformer,

$$\text{so } \boxed{P_s = P_p = 24 \text{ W}}$$